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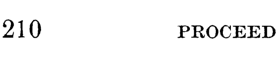
THE CRYSTALLIZATION OF MOLYBDENITE.

BY AMOS P. BROWN.

Although molybdenite, $Mo\ S_2$, has been known to mineralogists since crystallography was first studied, its crystalline form has never been satisfactorily determined. It has been provisionally assigned to the hexagonal and monoclinic systems by different authorities, the general opinion being that it is hexagonal. The crystals that have thus far been examined can be explained on a hexagonal basis, but they are not sufficiently lustrous to admit of very exact measurement, and the softness of the substance also militates against the exact determination of its angles. The locality at Frankford, Philadelphia, has long been known to mineralogists as affording well crystallized molybdenite, and I have for some years been collecting material from there with a view of making a crystallographic study of the mineral. Having in hand some crystals which are sufficiently lustrous for measurement on the reflecting goniometer I have examined them and obtained some positive results.



The crystals are hexagonal in habit, consisting of six sided prisms and barrel shaped crystals, the best of which are not more than 6 mm. in diameter. They strongly recall some mica crystals and seem often to show a twinning with the basal pinacoid as the composition face. A number of crystals were examined, the one giving the best results being a nearly perfect hexagonal plate of some 5 mm. diameter, which represents a broken crystal, only one termination being preserved. Nearly all of the faces gave fair images but the basal pinacoid was uneven, due to slight crumpling, and gave several images. By observations on a number of crystals these angles could be checked, however. The pyramid as a termination was not observed, all crystals examined showing the basal termination. The following crystallographic constants were observed:

Molybdenite. Hexagonal, axis $c=1.908$; $0001 \wedge 10\bar{1}1=65° 35'$

Forms observed: c (0001, $0P$), o ($10\bar{1}1$, P, O), p ($20\bar{2}1$, $2P$, 2), q ($30\bar{3}1$, $3P$, 3), m ($10\bar{1}0$, ∞P, 1).

Angles:	Observed.	Calculated.
$c\,p=$	77° 15′	77° 13′
	(77° 17′)	
	(77° 7′)	
$c\,q=$	81° 31′	81° 23′
$mm=$	60° 2′	60°

Besides these, the angle $c\,m$ was observed as 89° 48′ and several other angles near 90° on different crystals, but in general the images from m in this zone were imperfect. The angle $c\,o=65° 35'$ was obtained in the same crystal in adjacent zones, it was observed on several crystals. Oscillatory combination and probably vicinal planes render the measurements somewhat irregular but the above shows that the crystals may be explained on a hexagonal basis. The angle commonly observed is $c\,p=77° 13'$ and has been reported as 75°. This seems to show that the pyramid $2P$, ($20\bar{2}1$) is more common than the others. Many crystals only show two pyramids and the basal pinacoid, in others the prism is more prominent. While it is still possible that better crystals may show the mineral to be monoclinic, the above results are of sufficient value to place on record. It may be added that etching figures on the basal cleavage seem to indicate a hexagonal, perhaps rhombohedral crystallization.